

On the whole, then, while we have not been able to find any statement which is certainly and distinctly wrong, we find a very great deal which is not only certainly and distinctly right but which is also exactly that concerning which a real student desires, but has hitherto been unable to obtain, information; and the whole is well and clearly written. We cannot therefore too strongly recommend teachers to adopt it at once as their text-book.

O. J. L.

#### OUR BOOK SHELF

*The Tea Industry in India; a Review of Finance and Labour, and a Guide for Capitalists and Assistants.* By Samuel Baildon, author of "Tea in Assam," &c. (London: W. H. Allen and Co., 1882.)

THE history of the discovery and introduction of what is generally known as Chinese tea, though often told, has a special interest to a very large proportion of the inhabitants of the civilised world. In every country, indeed, on the face of the globe, the people use some beverage which they know as tea, and which is prepared in a similar way to that in use amongst ourselves, namely, by infusion, and often, though made from the foliage of indigenous plants, having the same chemical properties as true tea. Considering the enormous money value the cultivation of the tea plant represents not only in this country, but in China and also in India, where it is continually extending, it follows that works on this special industry would meet with a wide circulation amongst planters, and managers and directors of tea companies, notwithstanding that books and papers on the subject are by no means scarce.

The work before us is one which, though containing a good deal of information on the practical working and financial aspects of tea planting is, moreover, written in a style that will be generally acceptable, especially among young planters, who have their way to make in the planting world, and who want the dry details or drudgery of a planter's routine of toil stated in a clear and at the same time easy manner.

We will not follow Mr. Baildon through all his chapters. A glance at the introduction will prove that his reason for writing the book has been to show that India is the country from whence we get the finest teas, and that it is also the country where we may look in future years for the bulk of our supply, holding out inducements, as many districts do, for the investment of capital and the application of bodily health and talent. In Chapter II., on "India the Home of the Tea Plant," quotations are largely made from the published works of well-known botanical authorities, to show that though cultivated from such a remote period in China that the plant is truly indigenous to India. The legends connected with the origin or discovery of the tea plant in China are told, one of which refers its discovery to the year of grace 510. The author points out that these legends do not prove that tea was discovered in a wild state in China. "The earliest mention," he says, "tells of people using it, and it may be inferred therefrom that they cultivated it. Precise and accurate information is obtainable as to the actual discovery of tea in Assam, away from habitations and in dense jungles far from 'cultivated grounds.' But similar information is not obtainable in connection with the first days of tea amongst the Chinese."

Referring to the altered character of certain districts in India now under tea cultivation, Mr. Baildon says, "Where once jungle and its deadly miasma concealed the riches and importance of the province, hundreds of thousands of acres of open land are now to be seen planted with tea. Compared with past times Assam is no longer a howling wilderness, and the change from hundreds of miles of waste into cultivated land has altered almost everything."

In proof of the superiority of Indian over China teas, the author advances many arguments and anecdotes of a powerful nature, which, however, may be summed up in the simple statement "that it is systematically used to fortify tea from China," and that there is only one case on record of anything approaching adulteration of Indian tea. It is stated that "every pound offered for sale in England can be guaranteed as absolutely pure," and this is its reputation with the trade. Mr. Baildon's statements on this head are, we believe, an honest record of facts, for it is well known that Indian teas are largely used in this country for mixing with inferior China teas. This system is well known as "blending," and is stated to be resorted to because the public taste has not yet become educated to the flavour of Indian teas alone. The English tea drinker, however, is rapidly assuming a taste for the Indian produce, and the demand for Indian tea is already very great.

On the question as to the kind of men likely to succeed as tea planters in India, Mr. Baildon has a great deal to say, and is very outspoken in what he does say. His estimate of a successful planter is evidently drawn from a thoroughly practical experience, and will no doubt serve to encourage some, as it will to discourage others.

The book has been carefully revised, and is unusually free from blunders, the author wisely omitting to go into the botanical character of the tea plants any more than a reference to the names under which the forms have been described.

*A Treatise on the Theory of Determinants; with Graded Sets of Exercises for Use in Colleges and Schools.* By T. Muir, M.A., F.R.S.E. (London: Macmillan, 1882.)

THERE has been a tendency of late among some of our mathematical writers to specialise their labours; thus, Dr. C. Taylor has confined his work chiefly, if not mainly, to the geometry of conics; and our present author, to the subject of determinants. This is, we think, a good practice. Mr. Muir is no novice, and has done good work in this field, much of which is original. We have long desiderated some such work as this. Mr. Scott's is very able, but we cannot but think it is hard for junior students. Mr. Muir, we are disposed to believe, has made the introduction to the subject easier for this class, at the same time that he brings before the reader all that could be expected in a text-book. The work before us consists of three chapters, the two first of which do not err on the side of brevity; but this fulness serves a purpose, viz. "that the reader may become thoroughly familiarised with the definition," which, by the way, is too long for us to reproduce here. Though the enunciation is long, the idea is easily grasped, and when taken in connection with the illustrations, is not likely to give much trouble to the student to master it. These chapters, as indeed the remaining one also, are copiously illustrated by graduated exercises. The third chapter is much more condensed in style, and treats of determinants of special form, viz. continuants, alternants, symmetric determinants, Skew determinants, and Pfaffians, compound determinants, and determinants whose elements are differential coefficients of a set of functions, to wit Jacobians, Hessians, and Wronskians.

In a final chapter is given an interesting historical and Bibliographical Survey, from which the reader learns that contributions have been made to the subject from the publication of the germinal idea (long unfruitful) by Leibnitz in 1693, down to this present work. We may refer for further information to the chronological "List of Writings on Determinants" (1693-1880), published by Mr. Muir in the *Quarterly Journal of Mathematics* for October, 1881. This, the completest list we have seen, was to have formed part of the present work. Though we have carefully read the book through, with the exception of the exercises, we have detected but three or four

typographical errors. There are appended "Results of the Exercises." We take leave of Mr. Muir with the hope that he may be soon called upon to revise his book, with a view to the issue of a second and succeeding editions.

*Experimental Chemistry for Junior Students* W. Emerson Reynolds. Part II. *Non-Metals*. (London: Longmans, Green and Co., 1882.)

THIS is a most excellent little book on experimental chemistry, and should be especially useful to medical students, for whom it is chiefly designed.

There is a very large amount of useful information and descriptions of experiments in clear, but not too commonplace language, to make a beginner using the book feel at any loss when he shall come to use a larger work. The experiments are numbered for reference, and are also in most cases explained by an equation in symbols.

The student who works through this book will certainly know something practical of chemistry, as it can scarcely be used as a cram book.

We notice that in some of the formulæ and equations the symbols are adorned with dashes, which it is to be hoped have been explained in the first part, otherwise they would be somewhat misleading, or at least confusing to students at the stage at which they commence to use the book.

#### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

#### Vivisection

IN NATURE (vol. xxv. p. 482) there is a letter signed "Anna Kingsford," to which I feel compelled to reply. Not that I contemplate convincing your correspondent of her error, for I have only facts to offer; I write only for the unprejudiced portion of the English public, to protest with indignation against the calumnies regarding physiology and so-called vivisection, especially as practised here by Prof. Schiff.

The theoretical arguments for and against vivisection have been discussed to satiety; I wish to keep strictly to a question of facts, and the only passages in Mrs. Kingsford's letter against which I protest, are the words, "the horrible tortures perpetrated by Professors Schiff, Mantegazza, and Paul Bert"; "the atrocities of vivisection"; "the prolonged and exquisite torments to which domestic animals are subjected"; and other similar passages. In the first place, Mrs. Kingsford shows how ignorant she is of the subject she undertakes to enlighten the public upon, by mentioning Mantegazza as "a fair type" of a Continental vivisectioner, when the truth is that Mantegazza did long ago make some experiments on living animals, but has not done so for very many years, is, in fact, not a vivisectioner.

As I have not been in Prof. Paul Bert's laboratory, and have therefore not been an eye-witness of his methods, I will say nothing of the attack against him.

I now come to Prof. Schiff, who, of all living physiologists, is the one who carries out the most numerous experiments, and who may therefore fairly be taken as a typical representative of physiological research on the Continent. Having been for the last two years constantly in the learned professor's laboratory (and, I may add, in a perfectly independent position), I am able to give authoritative testimony as to his methods of study, and this testimony is, that *never* during this time was vivisection practised on a *feeling* animal; and I have repeatedly heard Prof. Schiff (whose word no one will dare to doubt) declare that he never in his life had operated on an animal that could feel pain—a fact which any one who knows this pre-eminently humane and kind man, will readily understand. I do not say that no vivisections are carried out; on the contrary, often several operations included under this comprehensive denomination are

performed in one day, but *never* so as to cause pain. Either the animal is instantaneously killed by a puncture in the "medulla oblongata," and artificial respiration set up, or it is completely anaesthetised, and Prof. Schiff's first care is always to see that this has been properly done. The trial with the eyeball is a sure criterion. The anaesthetised animals are eventually killed in the same manner as the others, while still completely unconscious; few other dogs have such a painless death. In those cases where animals which have been operated on are kept alive for ulterior observations, the best proof that they do not suffer pain is the excellent appetite and healthy appearance of the dogs in the school of medicine here, where they are, moreover, excellently well-housed and fed, for Prof. Schiff says: "I like my dogs to be well cared for in every way." So much for the "horrible tortures" perpetrated on the continent.

I may be allowed to repeat a few words fallen from Prof. Schiff's mouth as characteristic of the man. On one occasion I heard him say: "I cannot bear the least pain being inflicted on animals;" on another, seeing me petting a dog which was to be experimented upon, he said: "one must never caress a dog before an operation, for otherwise, although one knows it feels no pain, one's hand is not steady for cutting."

It is true that there do exist experiments in which the animal must retain consciousness in order that the effects may be watched; but just because the animal would suffer pain, *these experiments are never carried out by Prof. Schiff*.

Prof. Schiff has repeatedly invited his calumniators (both publicly and privately) to come to his laboratory, which is open at every hour of the day to all who wish to form an unbiased opinion on the methods of vivisection, and to see with their own eyes the real facts of the case; not one has ever accepted this invitation—which shows how deep the love of truth is in some hearts.

B.SC., STUDENT OF MEDICINE

Geneva, April 6

#### Precious Coral

I WAS very much interested in Prof. Moseley's note on "Precious Coral," which appeared in NATURE (vol. xxv. p. 510). During, or rather after our deep-sea explorations in the Mediterranean, last summer, the *Washington* passed a week exploring the coral-yielding banks between Sicily and Cape Bon (Africa); we were also therefore on the coral-banks of Sciacea. Most of the coral I saw—I mean, of course, precious coral—was dead and blackened, and I saw large quantities in the same state, and from the same locality at Naples. At the extreme edge of the Sciacea bank is the extinct volcano, now covered with a few fathoms of water, known as Ferdinandea or Graham's Island. I believe that the eruption of that volcano may explain the quantities of dead coral around. As to the black colour, I am of opinion that it may be due to the decomposition of organic matter, rather than to the presence of binoxide of manganese; some of the bottom samples which I collected at various depths, turned quite black after a few weeks. The disappearance of the black colour on prolonged exposure to the sun, would, I believe, confirm my view. It must also be borne in mind that precious coral, in the Mediterranean at least, never is found in mud or in muddy waters, but grows mostly on a regular coral-rock formed by Madrepora of different species.

I have often heard of Japanese coral, and saw some fine samples at the International Fishery Exhibition of Berlin, in 1880; they came from Okinawa, or Kotshi, where, in 1877, a quantity of the value of 9000 dollars was collected. It is this species which has been called *Corallium secundum* by Prof. Dana, if I am not mistaken.

A third species or variety of precious coral is found near the Cape de Verd Islands, especially San Jago; it has been distinguished by Prof. Targioni as *C. lubrani*.

As a *finale*, I may add that very little precious coral is found off Torre del Greco, from which place most of the coral fishermen hail, and in which place much of the coral collected is worked.

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#### Phenological Observations on Early Flowers and Winter Temperatures

THE relation of temperature to the earliness of the season is too obvious to be overlooked, but methods of representing it numerically are of considerable interest. Since 1878 this has been done for about thirty stations in the United Kingdom by